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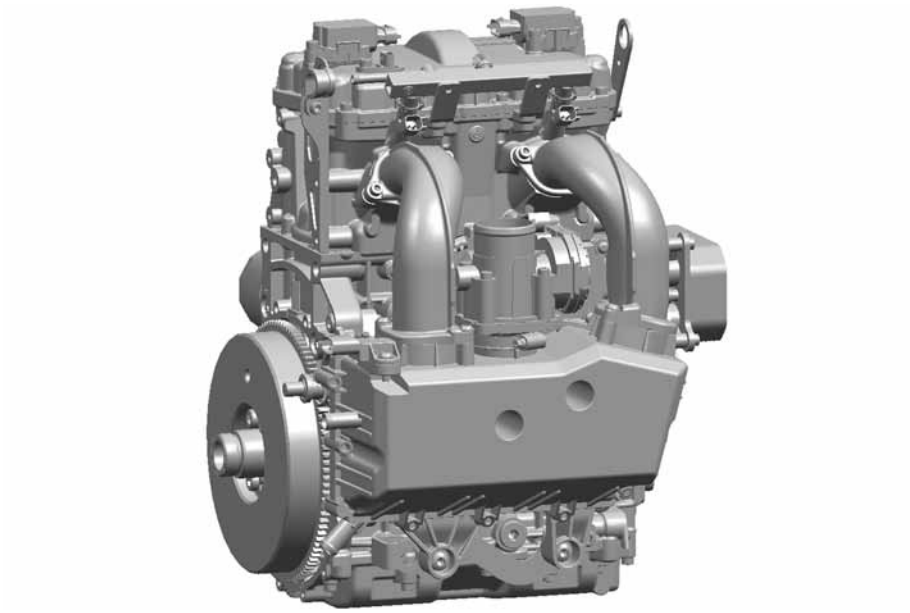

SERVICE MANUAL

4-Stroke Engine
MPE 850 IND NA

This service manual is valid for the following engine variants:

– 406555

406555_SHB
Rev 1.0
10.07.2012
en_English

Read this service manual thoroughly before operating the engine for the first time.

- Translation of the original service manual -

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1 About this document

This service manual was designed to help you operate the engine safely and reliably.

Observe the following information:

– Read this service manual thoroughly before operating the engine for the first time.
– The service manual is for the engine in your portable fire pump.
– Keep the service manual in a safe place.
– Make sure that all personnel using the portable fire pump have access to the service manual.
– If you sell the portable fire pump, always pass on the service manual to the new owner.
– The latest version of the service manual is available for download in other languages from our web site www.weber-motor.com.
– Always read the portable fire pump manufacturer‘s documentation.
– Some figures in this service manual are general illustrations and may differ from the actual engine.

1.1 Meaning of the symbols and signal words

Item	Meaning
NOTICE	The signal word *NOTICE* indicates potential property damage.
Information	The signal word **Information** indicates specific features and recommendations.
	Tools, service parts and supplies required for tasks covered in the chapter.

2 Safety

This engine is state-of-the-art and built according to recognized safety-technical regulations. Ignoring the information in this service manual may result in personal injury or property damage.

Read and observe the following safety messages carefully before operating the engine for the first time.

Observe all generally applicable laws and regulations in addition to the information in this service manual:

– accident prevention
– environmental protection
– handling of hazardous materials
– personal safety equipment
– traffic laws

2.1 Meaning of the safety alert symbol and signal words

Item	Meaning
	The safety alert symbol draws your attention to possible dangers.
WARNING	The signal word **WARNING** indicates a potentially dangerous situation that may lead to a serious or fatal injury.
CAUTION	The signal word **CAUTION** indicates a potentially dangerous situation that may lead to a minor or moderately severe injury.

2.2 Important safety messages

Service tasks

In order to keep your engine in a safe operating condition, regular servicing is essential. It is your responsibility to ensure that the engine is serviced correctly.

► Perform regular inspections and observe the specified service intervals.

Service tasks in the workshop

All service tasks described in Chapter 8 **Service tasks in the workshop** require special technical knowledge of the engine.

► All service tasks described in chapter 8 **Service tasks in the workshop** must be performed by a workshop authorized by Weber Motor or the portable fire pump manufacturer.

Malfunctions

Engine malfunctions pose a safety risk to personnel.

► Only operate the engine when in perfect condition.

► All malfunctions must be repaired immediately in a workshop authorized by Weber Motor or the portable fire pump manufacturer.

Spare parts

All the components in your engine have been carefully tested and fulfill strict quality and safety requirements. Externally supplied parts cannot fulfill these requirements.

► Always use original Weber Motor spare parts.

Add-on parts and modifications

The consequences of attaching add-on parts and making unauthorized modifications to the engine are unknown and pose a safety risk to personnel.

► Modifications and the attachment of add-on parts is only permitted if approved or instigated by Weber Motor.

Hot engine components

Engine components become extremely hot during operation.

► Do not touch any engine components during operation.

► Switch off the engine and wait until the components have cooled.

Engine power supply

Some service tasks require disconnection of the engine from the power supply. Starting the engine inadvertently may endanger the safety of personnel.

Read the portable fire pump manufacturer‘s documentation for more information.

► Disconnect the engine from the power supply when requested.

Engine exhaust gases

Engine exhaust gases contain carbon monoxide (CO). Inhalation of carbon monoxide can deprive the body of oxygen and result in organ damage or even death by asphyxiation.

► When operating the engine in enclosed spaces, use exhaust hoses to direct the engine exhaust gases into the open.

Handling of fuel, engine oil and coolant

Operating materials pose a health risk.

► Always read the manufacturer's instructions.

► Always wash your hands prior to eating, smoking and using the toilet as well as at the end of the working shift when working with operating materials.

Operating materials are hazardous to the environment.

► Never allow operating materials to escape into the groundwater, water courses or sewage system. Always dispose of operating materials according to applicable national regulations.

Danger of slipping on spilled fluids.

► Always use a filler neck or funnel when filling components with operating materials.

► Always clean up any spilled operating materials immediately.

Fuel

Fuel is highly flammable. Vapors may ignite and cause an explosion.

► Do not smoke in the vicinity of the engine and do not allow naked flames or sparks near the engine or the fuel system.

► Never fill with fuel while the engine is running.

► Do not start the engine if there is a smell of fuel or you suspect that fuel is leaking. Have a workshop authorized by Weber Motor or the portable fire pump manufacturer inspect the engine immediately.

► Fuel on hot surfaces can cause fires.

► Do not extinguish with water. In the event of a fire, use foam, dry chemical or carbon dioxide extinguishers.

California Proposition 65	Warning against chemicals/hazardous materials according to the law of the state of California. This product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

3 Description

3.1 Intended use

The MPE 850 IND NA has been designed for powering portable fire pumps.

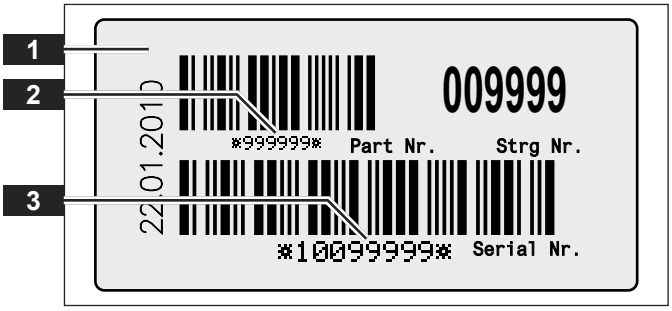
The engine was not designed or intended for any other use.

3.2 Identification

Each engine is assigned two identification numbers. Both numbers are printed on a label 1 affixed to the engine.

The 6-digit part number 2 is the number of the engine variant.

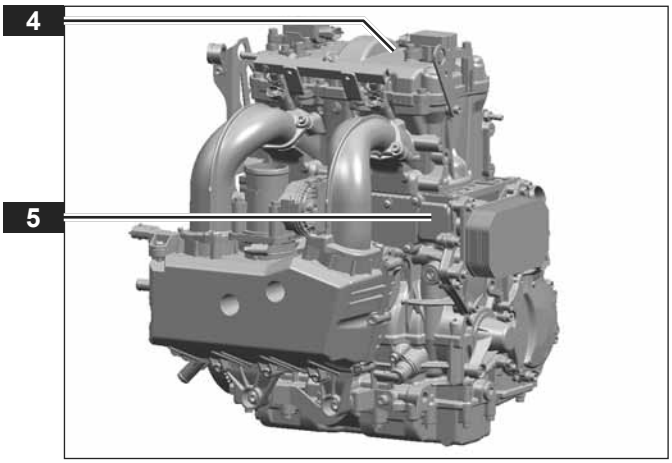
The 8-digit serial number 3 is a unique number for each individual engine.



The labels with the part number and the serial number are located on the valve cover 4.

The 8-digit serial number is also engraved on the crankcase 5.

Take the time to enter the part number and serial number in chapter 9 **Confirmation of service tasks**. Both numbers are required when making queries about your engine.



3.3 Fuel

NOTICE	**Engine damage and loss of power caused by fuel with an insufficient octane rating.** Fuel with an insufficient octane rating causes knocking during combustion. Which results in excessive loads and damage to the crank drive within a short time. ► Always use fuel with the recommended octane rating.

Fuel quality	unleaded gasoline („super unleaded“), with an octane rating of at least 95 ROZ or 85 MOZ USA: at least Premium 91, unleaded

3.4 Engine oil

NOTICE	**Engine damage due to incorrect engine oil grade or viscosity.** An incorrect engine oil grade or viscosity causes excessive wear and moving parts may start to seize up. ► Always use the recommended engine oil. ► Do not mix engine oils of different grades or degrees of viscosity.

Engine oil	0W 40 completely synthetic, at least API SJ, ACEA A3/B3
Fill quantity	See the portable fire pump manufacturer‘s documentation.

Information! Weber Motor recommends you always keep a supply of engine oil to hand. Consult your local portable fire pump dealer.

3.5 Coolant

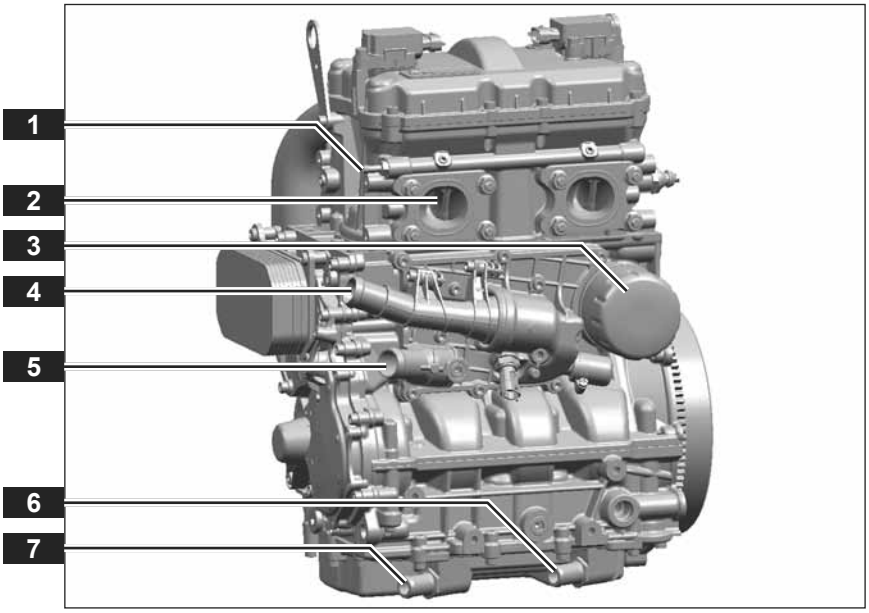
NOTICE	**Freezing, overheating or corrosion due to incorrect mixing ratio or unauthorized coolant additives.** An incorrect mixing ratio reduces the cooling capacity. Combining different coolant additives may trigger a chemical reaction and they may lose their effectiveness. ► Use the same coolant throughout the year in the mixing ratio specified. ► When topping up the coolant, do not change the mixing ratio. ► Always use approved coolant additives when topping up the coolant.

Coolant additive	Coolant additive based on ethylene glycol, silicate- and nitrite- free, suitable for aluminium engines
Mixing ratio	50 % water + 50 % coolant additive
Fill quantity	See the portable fire pump manufacturer‘s documentation.
Approved coolant additives	BASF Glysantin G 30
	Chevron Havoline Extended Life Coolant XLC+B
	Valvoline Zerex G 30

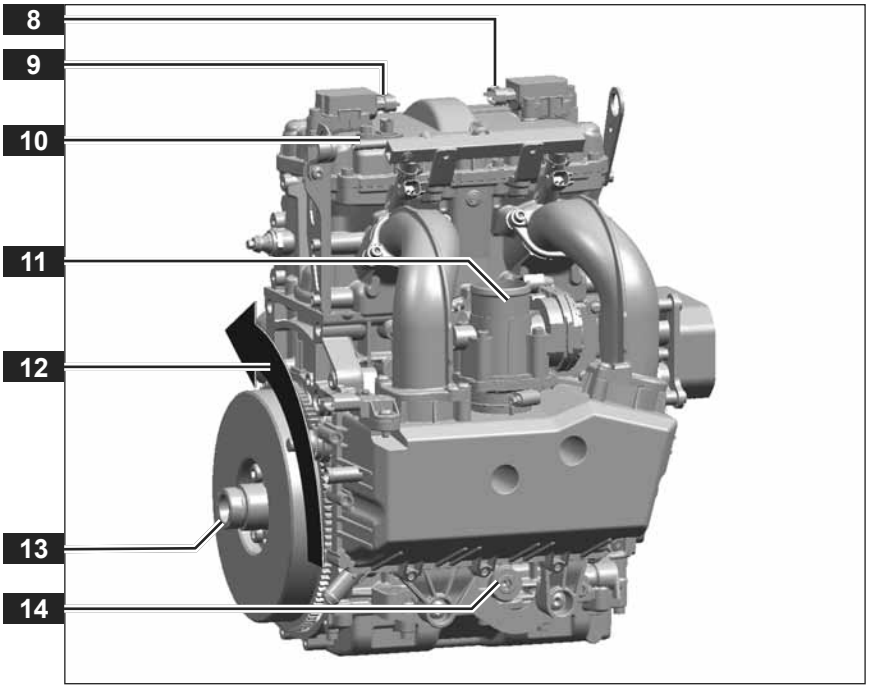
Information! Weber Motor recommends you always keep an adequate supply of ready mixed coolant to hand. Consult your local portable fire pump dealer.

3.6 Engine components and information

- Coolant circuit vent 1
- Exhaust ducts 2
- Oil filter 3
- Coolant circuit to the heat exchanger 4
- Coolant circuit from the heat exchanger 5
- Engine oil supply 6
- Engine oil return 7

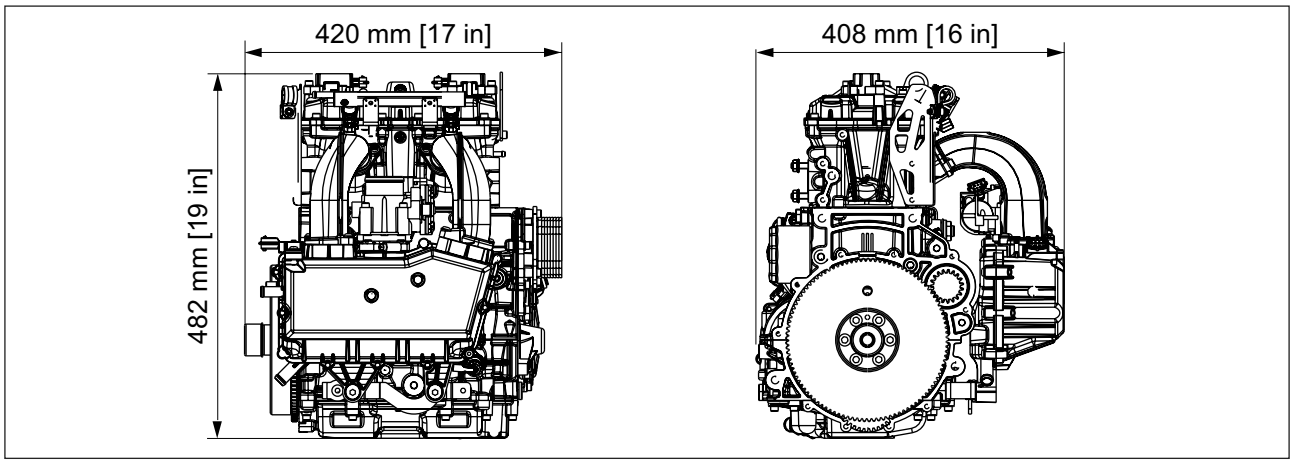


- 1st cylinder 8
- 2nd cylinder 9
- Fuel supply 10
- Air intake 11
- Engine rotation direction 12
- Stub shaft 13
- Crankcase vent 14



3.7 Technical specifications

Type	4-stroke gasoline engine, parallel twin with balance shaft and overhead camshaft (SOHC)
Displacement	846 cm³
Number of cylinders	2
Bore x stroke	89 mm x 68 mm [3.5 in x 2.7 in]
Compression ratio	11,5 : 1
Engine power	Godiva 1710: 42 kW [57 PS] @ 5600 min^{-1} [rpm] SAE J1349
	Godiva 1210: 22 kW [30 PS] @ 5250 min-1 [rpm] SAE J1349
Speed limit	6500 min^{-1} [rpm]
Idle speed	1250 – 1750 min^{-1} [rpm]
Carburation	sequential multipoint intake manifold
Lubrication system	dry sump
Cooling system	closed coolant circuit
Engine management system	Synerject Easy-U
Throttle body	electronically controlled, dia. = 44 mm [1.73 in]
Ignition system	electronic ignition
Starter system	electric starter
Generator, internal	> 450 W @ 4000 min^{-1} [rpm]
Weight	55 kg [121 lb] without engine oil and coolant
Dimensions	see figure



4 Operation

Familiarize yourself with the portable fire pump before operating the engine. Read the portable fire pump manufacturer‘s documentation.

4.1 Service intervals

In order to keep your engine in a safe operating condition, regular servicing is essential.

The following service tasks can be performed by trained mechanics.

Activity	before operation
Check oil level	■[1]
Check coolant level	■[1]

[1] or at least once a week

The following service tasks require mechanical knowledge and special technical knowledge of this engine. These service tasks must be performed in a workshop authorized by Weber Motor or the portable fire pump manufacturer.

Activity	1st service after 25 h[1]	subsequent service intervals every 100 h[1]	subsequent service intervals every 200 h[1]	preparing for storage[4]
Change engine oil and oil filter	■[2]	■[2]		■
Check and adjust valve play	■		■[3]	
Replace spark plugs			■[3]	
Check spark plugs				■
Change coolant	See the portable fire pump manufacturer‘s documentation.			
Engine internal preservative				■
Fuel stabilizer				■
Replace fuel filter	See the portable fire pump manufacturer‘s documentation.			

1 h = hours of operation
2 or at least once a year if the hours of operation specified above are not reached before that
3 or at least every two years if the hours of operation specified above are not reached before that
4 if you do not intend to operate the engine for more than 30 days

4.2 Operation during the break-in period

The way you operate the engine during the first five hours of operation is a major factor in achieving the required performance and extending the service life of the engine.

Observe the following points to ensure that the engine parts break in properly:

Avoid	Engine speeds over 5500 min-1 [rpm]
	long periods of idle operation
	long operating periods at low engine speeds
	long operating periods at the same engine speed
	long operating periods at full load
Good	changes in engine speed
	when the engine is warm, momentary bursts of acceleration

4.3 Before operation

4.3.1 Checking coolant level

See the portable fire pump manufacturer‘s documentation.

NOTICE

Danger of overheating caused by a lack of coolant.

Insufficient coolant leads to deformation, stress cracking and leaks in the cylinder head gasket.

The increase in pressure will cause the hoses to leak.

► Always check the coolant level before operating the engine.

4.3.2 Checking oil level

See the portable fire pump manufacturer‘s documentation.

Information! Your engine uses a dry sump lubrication system. Engine oil is pumped from the engine into the oil tank while the engine is operating. When the engine is switched off, a portion of the engine oil flows from the oil tank slowly back into the engine. Therefore inspect the oil level immediately after switching off the engine.

NOTICE

Engine damage caused by a lack of engine oil.

A lack of engine oil will cause moving components in the engine to seize.

► Always check the oil level before operating the engine.

NOTICE

Engine damage caused by excessive engine oil.

If the quantity of engine oil is excessive, oil may enter the intake system through the crankcase vent and damage the engine.

► Check the oil level as described in the portable fire pump manufacturer‘s documentation.

► Measure the engine oil filling quantity before topping up the engine oil.

5 Special scenarios

5.1 Engine idle for more than 30 days

If you do not intend to operate the engine for 30 days or more, prepare the engine for storage. Preparing the engine for storage will prevent the cylinder from corroding and ensure the engine starts again correctly at the end of the storage period.

Preparations for storage require special technical knowledge. Preparations must be performed in a workshop authorized by Weber Motor or the portable fire pump manufacturer.

6 Malfunctions

In the event of a malfunction, please contact a workshop authorized by Weber Motor or the portable fire pump manufacturer immediately.

7 Dealer and servicing network

7.1 Locating a workshop

An extensive global dealer and servicing network is available. The dealer and servicing network provides assistance with any queries relating to the engine. Visit our web site www.weber-motor.com for a list of all authorized Weber Motor workshops.

7.2 Service and spare parts

Weber Motor offers a selection of accessories to prepare you for the most important situations. Visit your local portable fire pump dealer or our web site www.weber-motor.com for more information.

7.3 Repairs

Repairs require mechanical knowledge and special technical knowledge of this engine. Weber Motor recommends you have any repairs performed by a workshop authorized by Weber Motor or the portable fire pump manufacturer.

7.4 Warranty

In the case of warranty claims, always consult a workshop authorized by the portable fire pump manufacturer. If that is not possible, contact your local portable fire pump dealer.

8 Service tasks in the workshop

8.1 Safety messages workshop

Service tasks in the workshop

All service tasks described in the following chapter require mechanical knowledge and special technical knowledge of this engine.

► All service tasks described in chapter 8 **Service tasks in the workshop** must be performed by a workshop authorized by Weber Motor or the portable fire pump manufacturer.

Service manual

Before reading chapter 8 **Service tasks in the workshop**, you must have read and understood all other information in the service manual.

► Read through the service manual carefully before performing any service tasks. Pay particular attention to the safety messages.

Engine power supply

All service tasks require disconnection of the engine from the power supply. Starting the engine inadvertently may endanger the safety of personnel.

Read the portable fire pump manufacturer‘s documentation for more information.

► Disconnect the engine from the power supply before performing any servicing tasks.

► Only reconnect the power supply to the engine once all service tasks are complete and all protective equipment is correctly fitted.

Protective equipment

Missing protective equipment poses a safety risk to personnel.

► Attach all protective equipment after completing the service tasks.

Tools

Unsuitable tools pose a safety risk to personnel.

► Always use tools listed in chapter 8.2 **Tools and accessories**.

8.2 Tools and accessories

8.2.1 Weber Motor service case

Weber Motor offers a service case that contains the following service parts. Visit your local portable fire pump dealer or our web site www.weber-motor.com for more information.

Figure	Description
	Oil filter
	Spark plug Champion RC7PYCBX
	Feeler gauge 0.05 – 2 mm
	Sealing kit valve cover

Figure	Description
	Valve adjustment shims in different sizes
	Serrated lock washer
	Valve adjustment kit

8.2.2 Equipment workshop

In addition to the service case, you will require the following tools and accessories for service tasks. The figures are only examples of suitable tools. All tools and accessories are available from specialist retailers.

Figure	Description
	Hexagon screwdriver 5
	Torque wrench 8 – 32 Nm [5 – 24 lbf ft] with extension and insert adapter
	Reversible ratchet with extension and insert adapter
	Hexagon screwdriver socket 5
	Caliper Measuring accuracy 0.05 mm

Figure	Description
	Bar magnet
	Spark plug wrench Wrench size 16 mm [5/8“] Diameter: maximum 22 mm [0.87 in]
	Spark plug brush
	Universal strap wrench
	Universal pliers

8.2.3 Supplies

You will require the following supplies to perform service tasks. Unless otherwise specified, use the products as directed by the manufacturer. All supplies are available from specialist retailers.

Supplies	Recommended products
Anti-Seize assembly paste for lubricating threaded connections	Weicon Anti-Seize „High-Tech“ ASW 040 P Loctite 8150
Engine internal preservative	Liqui Moly, Germany
Fuel stabilizer	Liqui Moly, Germany
Sealing surface cleaner	Liqui Moly brake and parts cleaner AIII, Germany

8.3 Changing engine oil and oil filter

8.3.1 Changing engine oil

See the portable fire pump manufacturer‘s documentation.

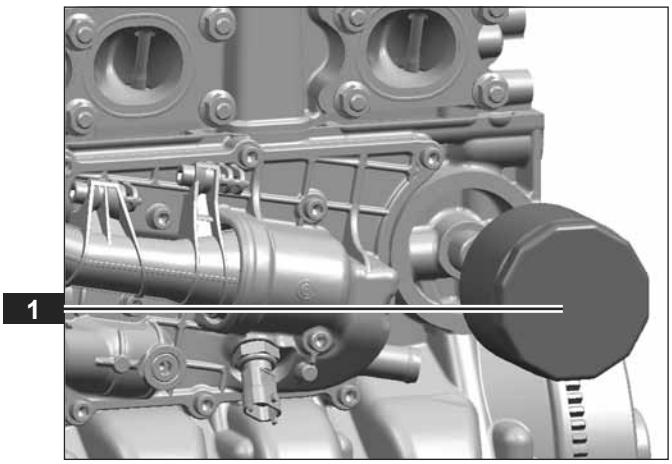
8.3.2 Replacing oil filter

– Protective gloves
– Oil filter
– Universal strap wrench
– Sealing surface cleaner

► Pump engine oil out. (See the portable fire pump manufacturer‘s documentation.)

CAUTION! Risk of burning on oil filter. The oil filter can become very hot. Wear protective gloves.

► Unscrew the oil filter 1 using a universal strap wrench.



► Replace the oil filter 2.

► Clean the sealing surface 3 with sealing surface cleaner.

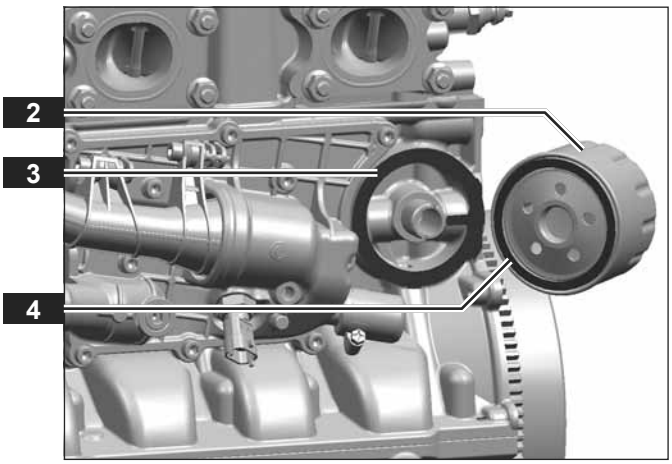
► Coat the oil filter seal 4 lightly with engine oil.

► Screw in the oil filter by hand.

Anziehdrehmoment:
10 Nm [7.4 lbf ft]

► Fill with engine oil. (See the portable fire pump manufacturer‘s documentation.)

► Start the engine and allow to run for 1 – 2 minutes.



8.4 Checking and adjusting valve play

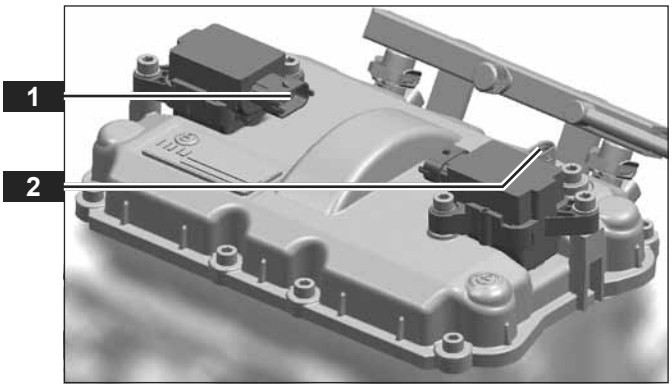
8.4.1 Checking valve play

- Sealing kit valve cover
- Serrated lock washers
- Feeler gauge
- Anti-Seize assembly paste
- Hexagon screwdriver 5 mm
- Torque wrench
- Hexagon screwdriver socket 5 mm

Check valve play with a cold engine.

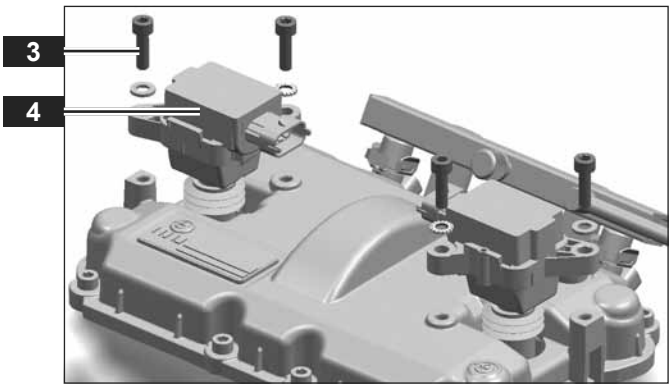
WARNING! Danger of serious cuts from the gear on the camshaft when the engine is started. Disconnect the engine from the power supply.

► Disconnect the wire harness connector from the ignition coils 1 and sensor camshaft 2.



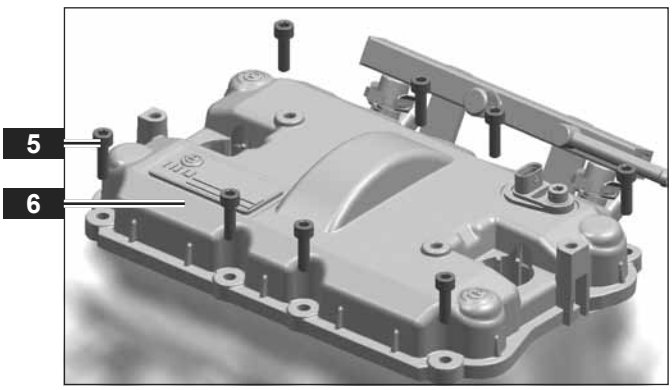
► Unscrew bolts 3.

► Unplug ignition coils 4.



► Unscrew bolts 5.

► Remove valve cover 6.



Information! The camshaft is turned using the crankshaft. The portable fire pump manufacturer has devised a suitable procedure for this. Read the portable fire pump manufacturer‘s documentation for more information. Always turn the crankshaft in the same direction as the engine rotates. (See chapter 3.6 Engine components and information.) Two rotations of the crankshaft correspond to one rotation of the camshaft.

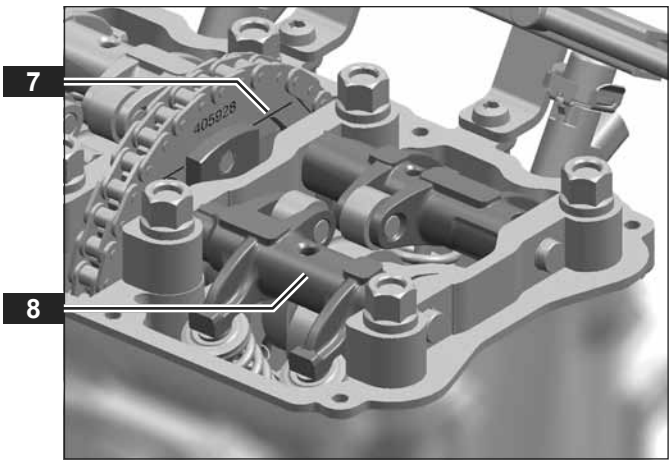
Checking the valve play on the 2nd cylinder

► Turn the camshaft until the position of the camshaft is as illustrated. (See the portable fire pump manufacturer‘s documentation.)

The camshaft is marked at the 2nd cylinder end only.

The marking 7 ends flush with the cross bar.

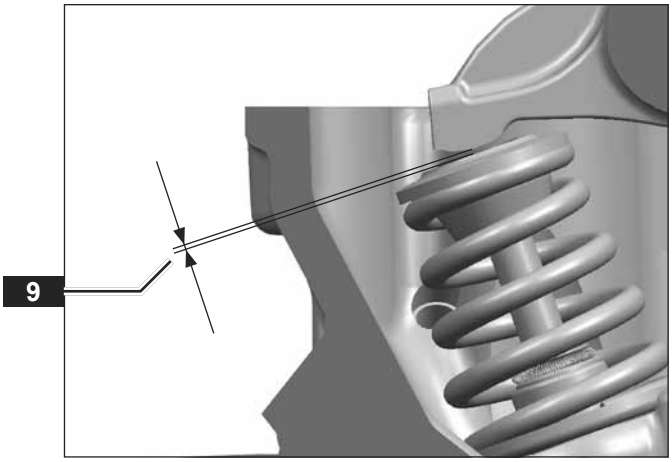
All rocker arms 8 on the cylinder have a certain amount of play.



► Check the valve play 9 of all valves on the cylinder using a feeler gauge.

Required valve play:
0,2 – 0,3 mm

► If the valve play of one or more valves is not right, continue with chapter 8.4.2 **Adjusting valve play**.



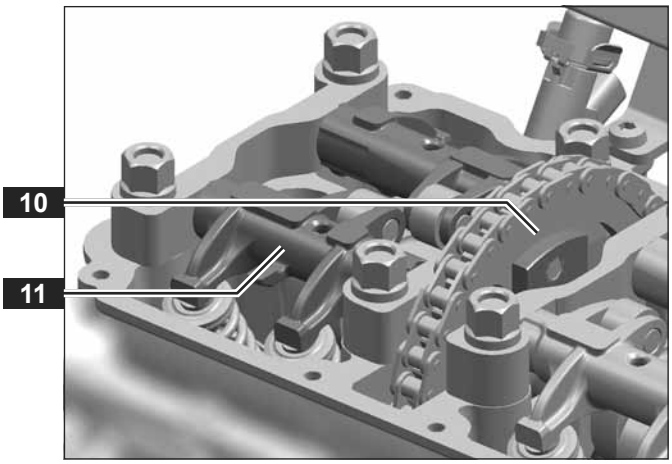
Checking the valve play on the 1st cylinder

► Turn the camshaft until the position of the camshaft is as illustrated. (See the portable fire pump manufacturer's documentation.)

The camshaft is marked at the 2nd cylinder end only.

The marking **10** is not visible.

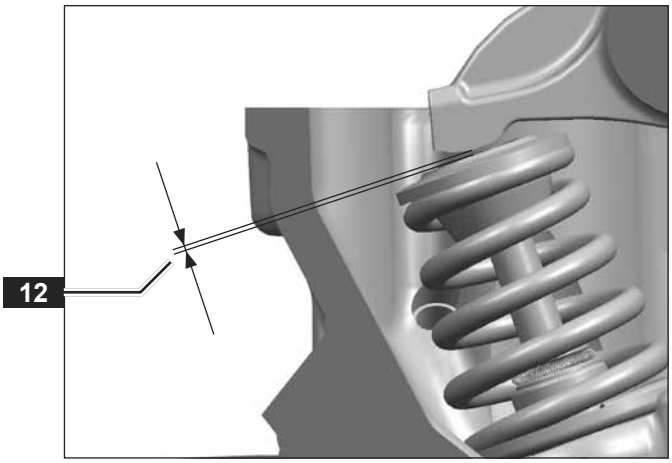
All rocker arms **11** on the cylinder have a certain amount of play.



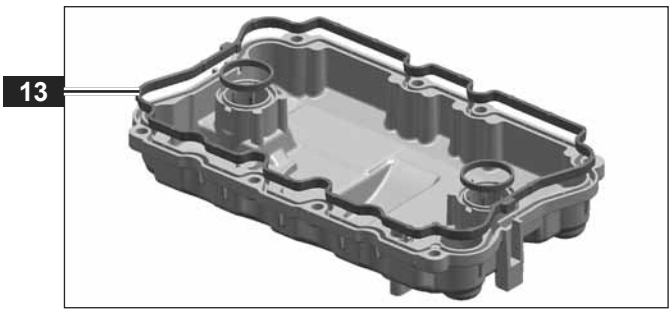
► Check the valve play **12** of all valves on the cylinder using a feeler gauge.

Required valve play:
0,2 – 0,3 mm

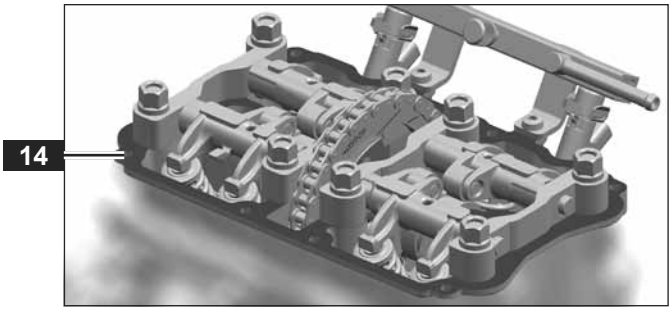
► If the valve play of one or more valves is not right, continue with chapter 8.4.2 **Adjusting valve play**.



► Replace valve cover seals **13**.



► Clean the sealing surface 14 with sealing surface cleaner.

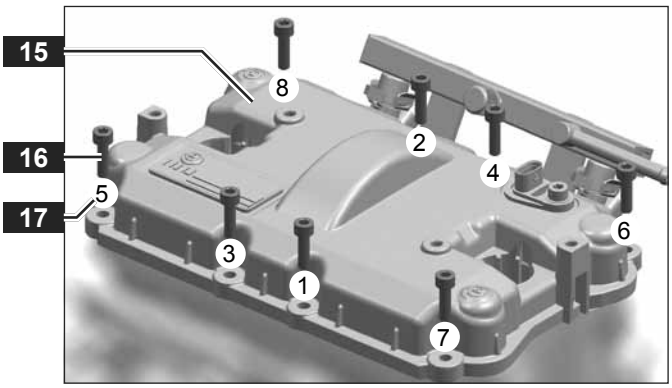


► Put the valve cover 15 on.

► Apply Anti-Seize assembly paste to all bolts 16.

► Tighten the bolts in the sequence shown 17 .

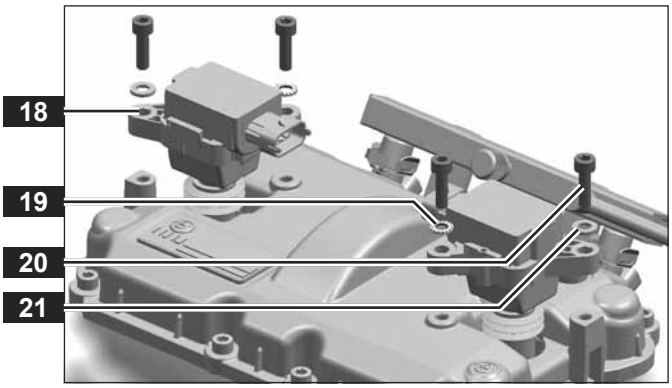
Tightening torque:
8 Nm +2 Nm [5.9 lbf ft +1.5 lbf ft]



► Insert the ignition coils 18.

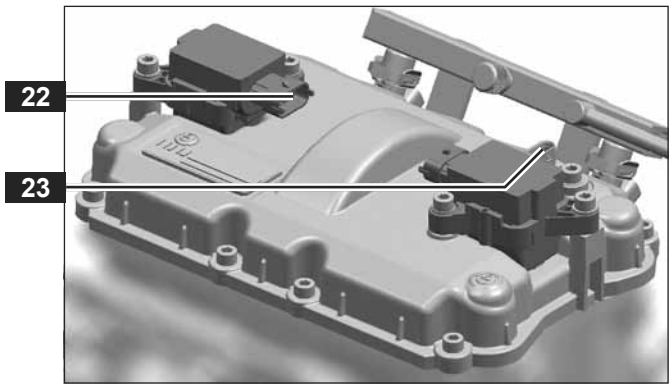
► Replace serrated lock washers 19. Assemble the bolts 20, washers 21 and serrated lock washers as illustrated.

Tightening torque:
8 Nm +2 Nm [5.9 lbf ft +1.5 lbf ft]



► Connect the wire harness connectors to the ignition coils 22 and sensor camshaft 23.

► Start the engine and allow to run for 1 – 2 minutes.



8.4.2 Adjusting valve play with valve adjustment kit

– Valve adjustment shims	– Valve adjustment kit	– Hexagon screwdriver socket 5
– Caliper	– Hexagon screwdriver 5	
– Bar magnet	– Torque wrench	

Information! The camshaft is turned using the crankshaft. The portable fire pump manufacturer has devised a suitable procedure for this. Read the portable fire pump manufacturer‘s documentation for more information. Always turn the crankshaft in the same direction as the engine rotates. (See chapter 3.6 Engine components and information.) Two rotations of the crankshaft correspond to one rotation of the camshaft.

Adjusting the valve play on the 2nd cylinder

WARNING! Danger of serious cuts from the gear on the camshaft when the engine is started. Disconnect the engine from the power supply.

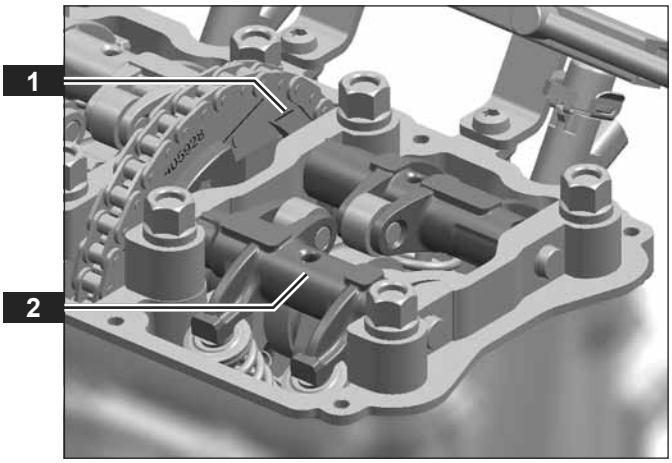
► Turn the camshaft until the position of the camshaft is as illustrated. (See the vehicle manufacturer‘s documentation.)

The camshaft is marked at the 2nd cylinder end only.

The marking 1 ends flush with the cross bar.

All rocker arms 2 on the cylinder have a certain amount of play.

► Continue with the section **Replacing valve adjustment shim**.



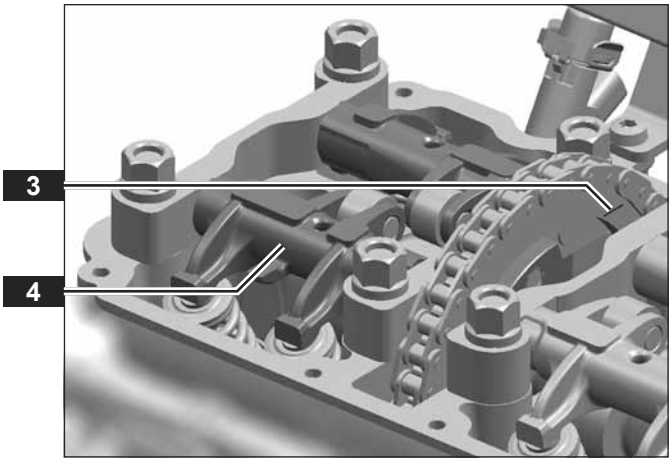
Adjusting the valve play on the 1st cylinder

► Turn the camshaft until the position of the camshaft is as illustrated. (See the vehicle manufacturer‘s documentation.)

The camshaft is marked at the 2nd cylinder end only.

The marking 3 ends flush with the cross bar. Otherwise, no inscription is visible.

All rocker arms 4 on the cylinder have a certain amount of play.



► Continue with the section **Replacing valve adjustment shim**.

Replacing valve adjustment shim.

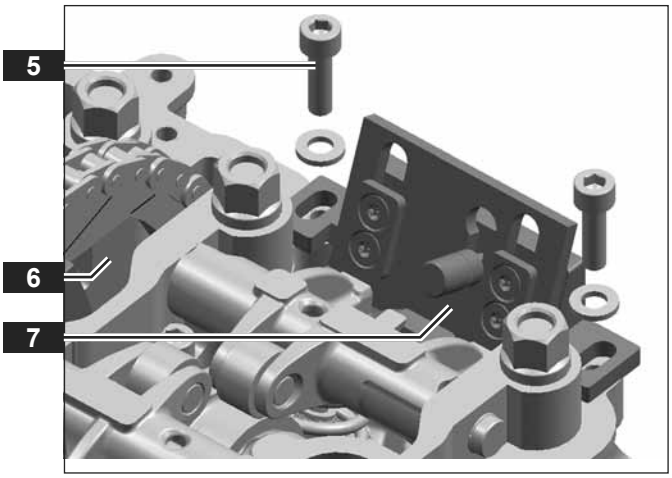
NOTICE! Engine damage from small components in the engine or cylinder head. Operating the engine when there are small components in the crankcase and cylinder head can result in serious damage and cause the crank drive to seize.

► Cover the chain channel 6.

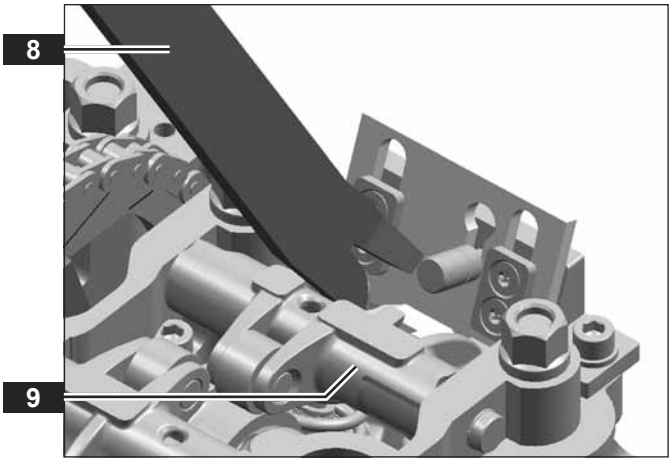
► Hold the valve adjustment tool 7 in position.

► Screw in the bolts 5.

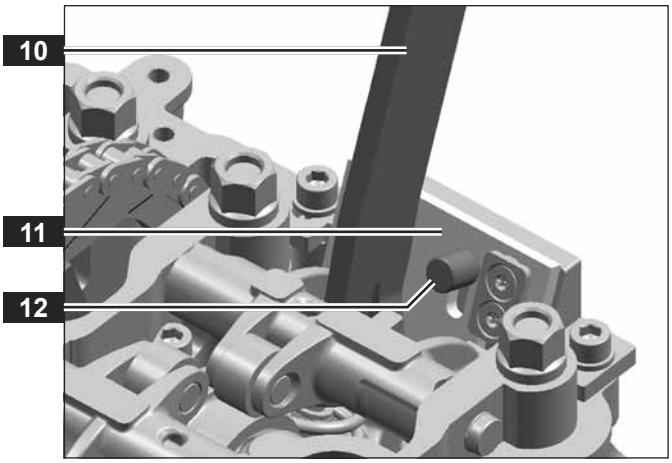
Tightening torque:
8 Nm +2 Nm [5.9 lbf ft +1.5 lbf ft]



► Position the rocker arm pusher 8 on the rocker arm 9.



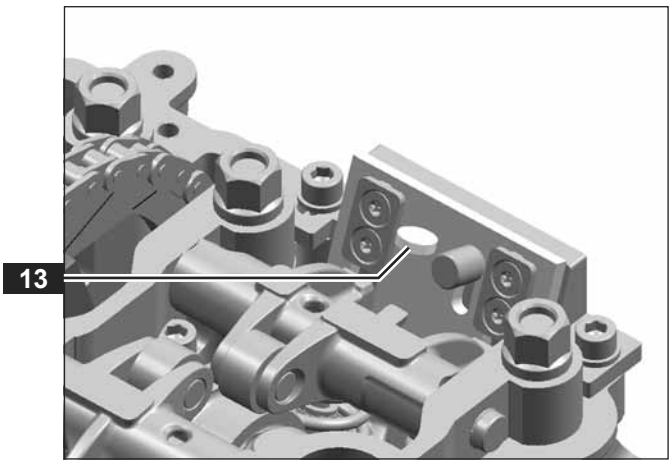
► Press down the slide plate 11 using the rocker arm pusher 10 until the pin 12 engages.



► Remove the valve adjustment shim 13 using a bar magnet.

► Measure the valve adjustment shim using a caliper.

► Insert the new valve adjustment shim.



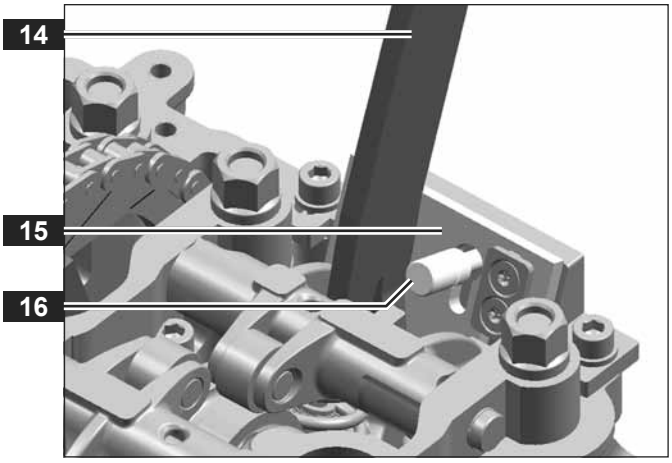
► Hold the rocker arm pusher 14 in position.

► Press down the slide plate 15 slightly using the rocker arm pusher.

► Slide the pin 16 forward by hand.

► Slowly release the rocker arm pusher.

The valve spring slides the slide plate upwards again.



► Unscrew the bolts 17.

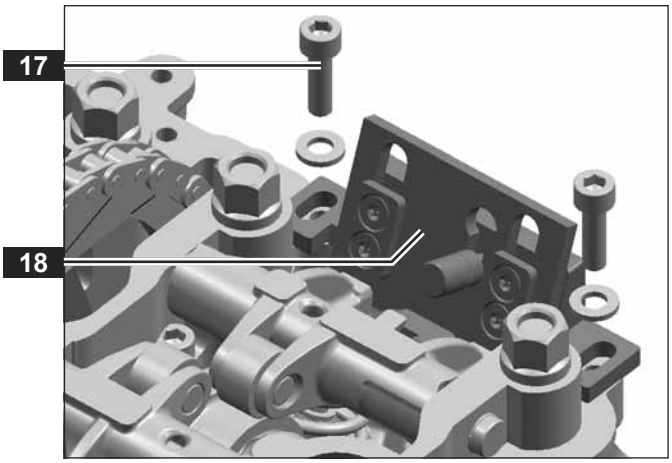
► Remove the valve adjustment tool 18.

► Remove the cover from the chain channel.

NOTICE! Valve breakage due to insufficient valve play.

► Check the valve play.

► Continue with chapter 8.4.1 **Checking valve play**.



8.4.3 Adjusting valve play without special tool

– Valve adjustment shims
– Caliper
– Bar magnet
– Universal pliers

Information! The camshaft is turned using the crankshaft. The portable fire pump manufacturer has devised a suitable procedure for this. Read the portable fire pump manufacturer‘s documentation for more information. Always turn the crankshaft in the same direction as the engine rotates. (See chapter 3.6 Engine components and information.) Two rotations of the crankshaft correspond to one rotation of the camshaft.

Adjusting the valve play on the 2nd cylinder

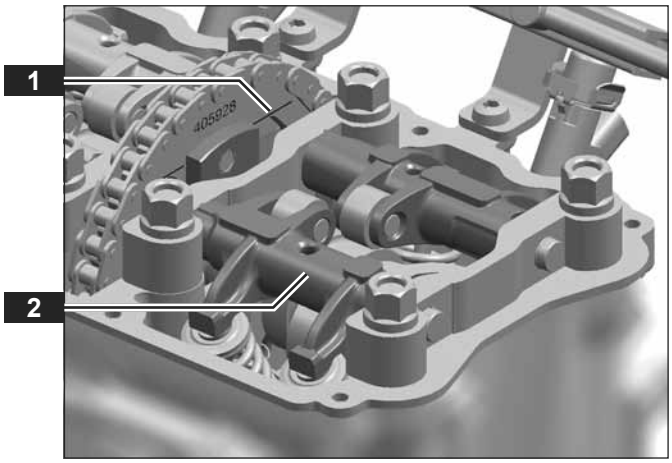
WARNING! Danger of serious cuts from the gear on the camshaft when the engine is started. Disconnect the engine from the power supply.

► Turn the camshaft until the position of the camshaft is as illustrated. (See the vehicle manufacturer‘s documentation.)

The camshaft is marked at the 2nd cylinder end only.

The marking 1 ends flush with the cross bar.

All rocker arms 2 on the cylinder have a certain amount of play.



► Continue with the section **Replacing valve adjustment shim**.

Adjusting the valve play on the 1st cylinder

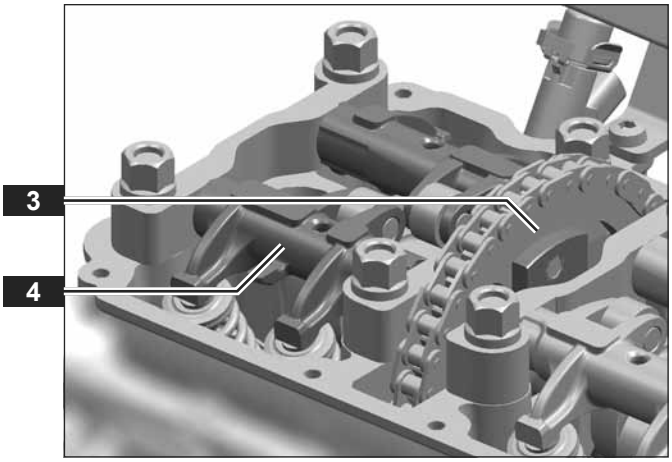
► Turn the camshaft until the position of the camshaft is as illustrated. (See the vehicle manufacturer‘s documentation.)

The camshaft is marked at the 2nd cylinder end only.

The inscription 3 is not visible.

All rocker arms 4 on the cylinder have a certain amount of play.

► Continue with the section **Replacing valve adjustment shim**.

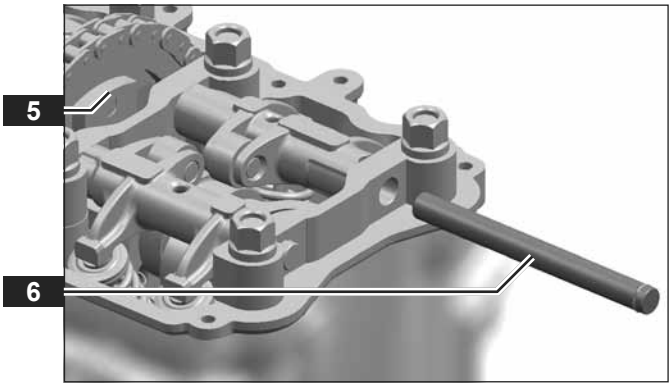


Replacing valve adjustment shim.

NOTICE! Engine damage from small components in the engine or cylinder head. Operating the engine when there are small components in the crankcase and cylinder head can result in serious damage and cause the crank drive to seize.

► Cover the chain channel 5.

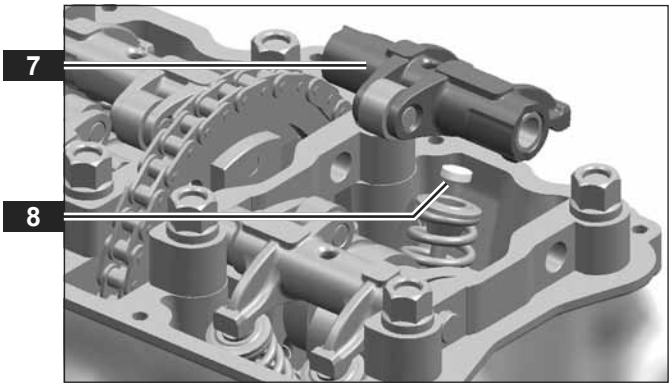
► Remove the rocker axle 6 using a universal pliers.



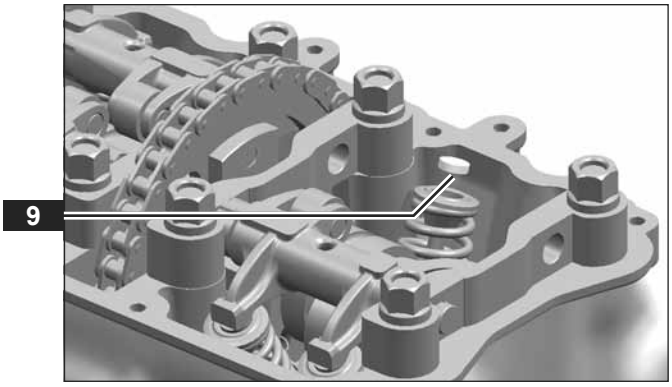
► Remove the rocker arm 7.

► Remove the valve adjustment shim 8 using a bar magnet.

► Measure the valve adjustment shim using a caliper.



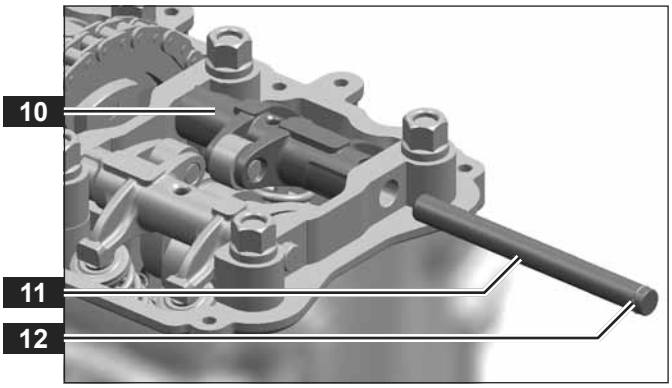
► Insert the new valve adjustment shim 9.



► Hold the rocker arm 10 in position.
► Check if the circlip 12 is installed.
► Slide in the rocker axle 11.
► Remove the cover from the chain channel.

NOTICE! Valve breakage due to insufficient valve play.

► Check the valve play.
► Continue with chapter 8.4.1 **Checking valve play**.

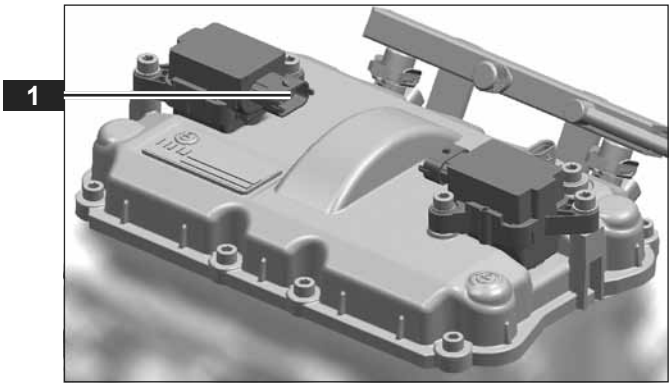


6.5 Replacing spark plugs

- Spark plugs
- Serrated lock washer
- Hexagon screwdriver 5 mm
- Torque wrench
- Reversible ratchet
- Hexagon screwdriver socket 5 mm
- Spark plug wrench

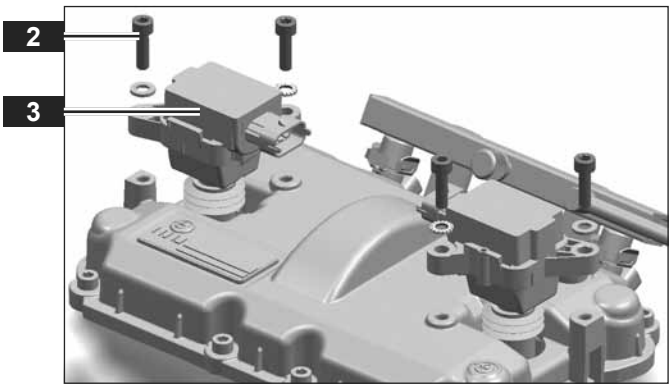
Remove spark plugs with a cold engine.

► Disconnect the wire harness connectors from the ignition coils 1.



► Unscrew bolts 2.

► Unplug ignition coils 3.



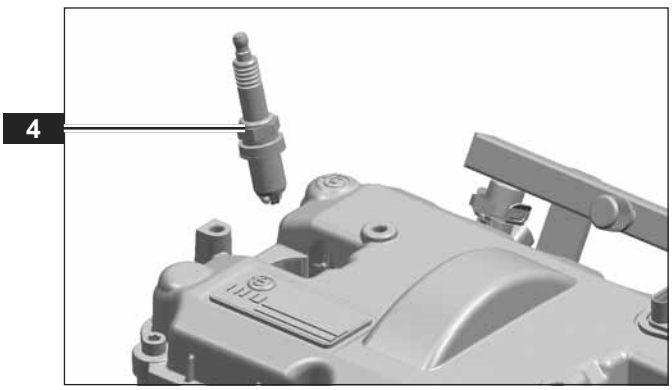
► Remove the spark plugs 4 using a spark plug wrench.

► Replace the spark plugs.

► Install the spark plugs using a spark plug wrench.

Tightening torque:

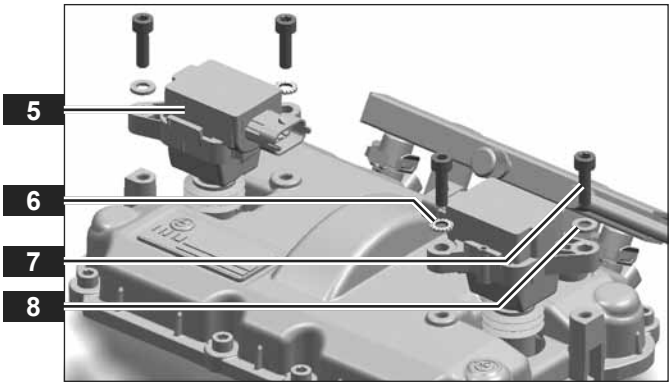
20 Nm +6 Nm [14.8 lbf ft ±4.4 lbf ft]



► Insert the ignition coils 5.

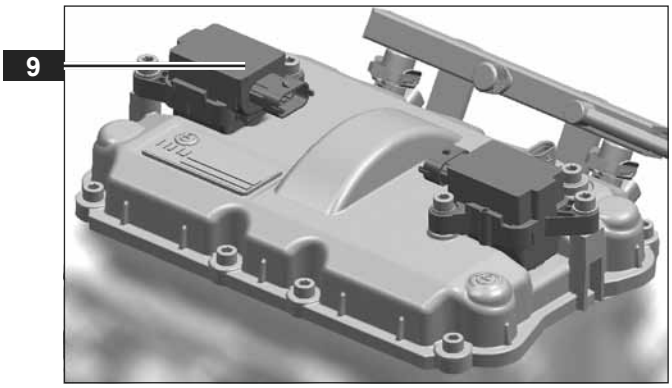
► Replace serrated lock washers 6. Assemble the bolts 7, washers 8 and serrated lock washers as illustrated.

Tightening torque:
8 Nm +2 Nm [5.9 lbf ft +1.5 lbf ft]



► Connect the wire harness connectors to the ignition coils 9.

► Start the engine and allow to run for 1 – 2 minutes.

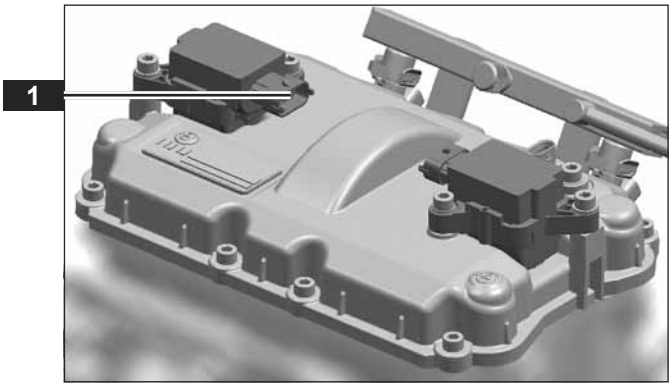


8.6 Checking spark plugs

- Serrated lock washer
- Hexagon screwdriver 5 mm
- Torque wrench
- Reversible ratchet
- Hexagon screwdriver socket 5 mm
- Spark plug wrench
- Feeler gauge
- Spark plug brush

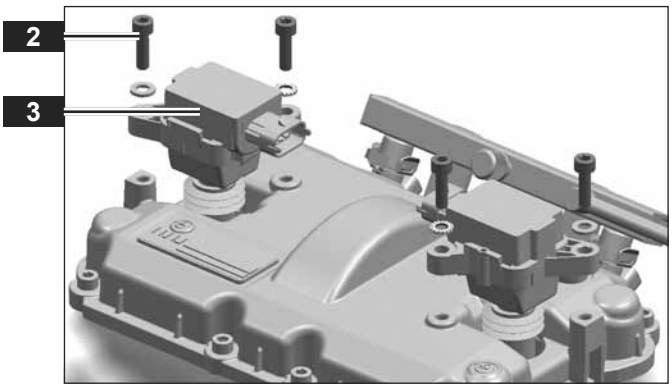
Remove spark plugs with a cold engine.

► Disconnect the wire harness connectors from the ignition coils 1.

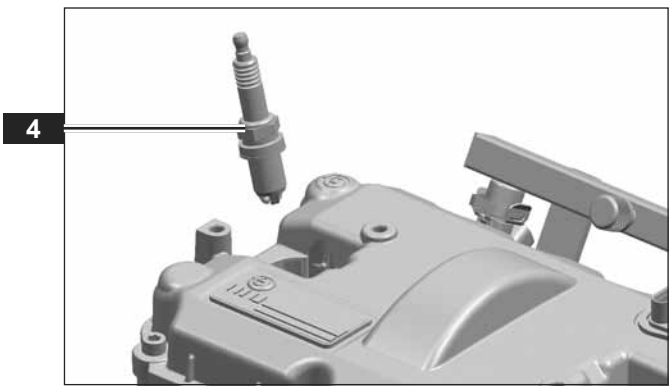


► Unscrew bolts 2.

► Unplug ignition coils 3.



► Remove the spark plugs 4 using a spark plug wrench.

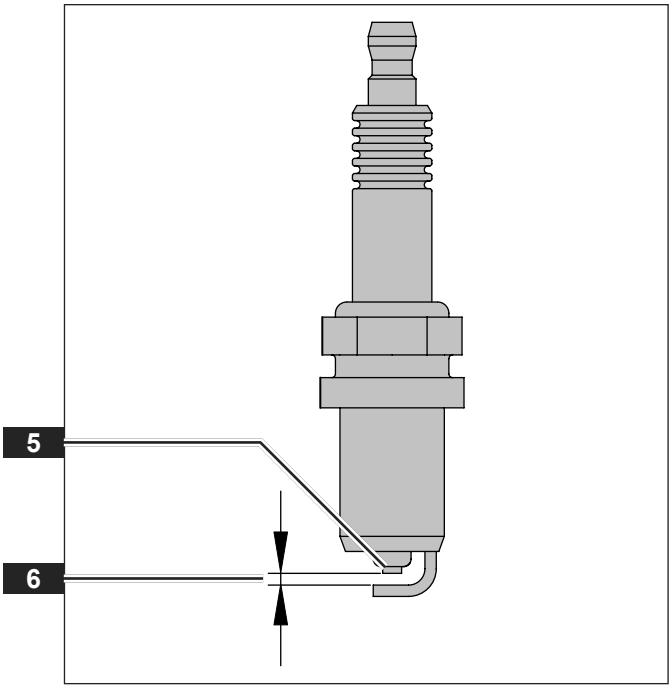


► If the electrodes 5 are extremely sooty, clean carefully using a spark plug brush.

► Check the spark plug gap 6 using a feeler gauge.

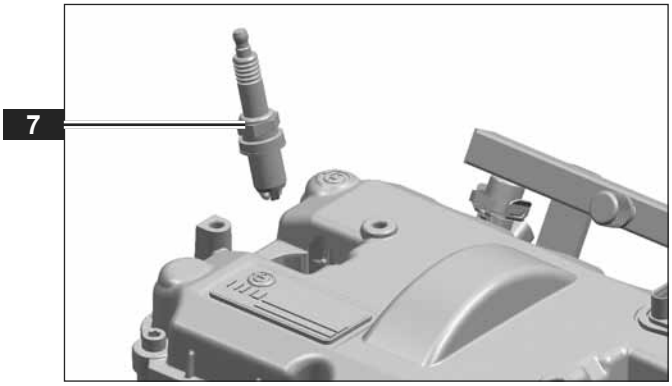
Required spark plug gap:
0,69 – 0,84 mm [0.028 – 0.032 in]

► If the spark plug gap is not satisfactory, replace the spark plug. Always replace spark plugs in pairs.



► Install the spark plugs 7 using a spark plug wrench.

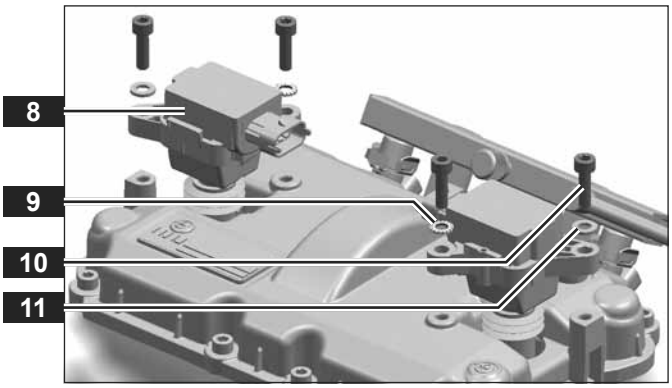
Tightening torque:
20 Nm +6 Nm [14.8 lbf ft ±4.4 lbf ft]



► Insert the ignition coils 8.

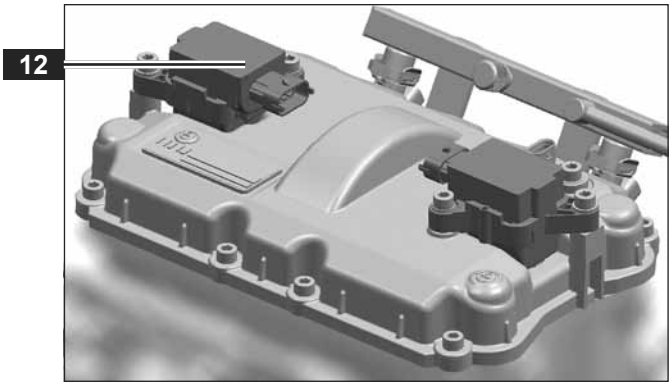
► Replace serrated lock washers 9. Assemble the bolts 10, washers 11 and serrated lock washers as illustrated.

Tightening torque:
8 Nm +2 Nm [5.9 lbf ft +1.5 lbf ft]



► Connect the wire harness connectors to the ignition coils **12**.

► Start the engine and allow to run for 1 – 2 minutes.



8.7 Changing coolant

See the portable fire pump manufacturer‘s documentation.

8.8 Replacing fuel filter

See the portable fire pump manufacturer‘s documentation.

8.9 Preparing the engine for storage

– Engine internal preservative
– Fuel stabilizer

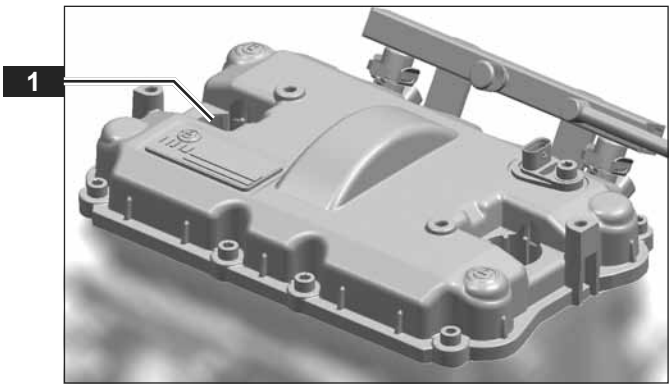
► Change engine oil and oil filter (See chapter 8.3 Changing engine oil and oil filter.)

► Fill up the fuel tank. Add a fuel stabilizer according to the manufacturer's instructions.

► Check spark plugs. (See chapter 8.6 Checking spark plugs.)

► Spray engine internal preservative into the cylinder through the spark plug bores 1 according to the manufacturer's instructions.

Do not start the engine again.



8.10 Disposal

When disposing of operating materials, replaced parts or the whole engine, always comply with the relevant applicable national laws and guidelines.

9 Confirmation of service tasks

Have the workshop personnel provide certification confirming that your engine was serviced. You can use the following documents.

Engine variant (6-digit) _ _ _ _ _ _ Date of initial registration _____

Serial number (8-digit) _ _ _ _ _ _ _ _

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced
	.....
	.....
	.....
	.....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced
	.....
	.....
	.....
	.....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced
	.....
	.....
	.....
	.....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced
	.....
	.....
	.....
	.....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced
	.....
	.....
	.....
	.....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced
	.....
	.....
	.....
	.....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Date:	**Work carried out:** ☐ Engine oil and oil filter changed ☐ Valve play checked ☐ Spark plugs replaced
Status hours of operation:	☐ Coolant changed ☐ Fuel Filter replaced ....
Company seal, signature	

Appendix

Engine manufacturer

Engine manufacturer	Weber Motor GmbH Otto-Lilienthal-Str. 5 88677 Markdorf Germany www.weber-motor.com

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